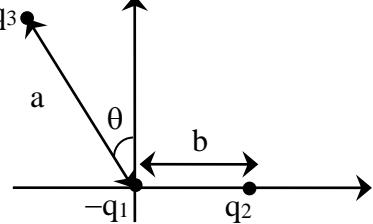
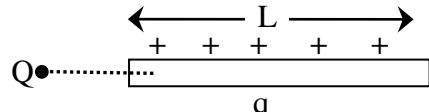


Daily Practice Assignment-1

Electrostatics

1. Which of the following charges is not possible?
 (a) $1.6 \times 10^{-18} \text{ C}$ (b) $1.6 \times 10^{-19} \text{ C}$ (c) $1.6 \times 10^{-20} \text{ C}$ (d) $1.6 \times 10^{-12} \text{ C}$
Ans: (c)
2. A conductor has been given a charge of $3 \times 10^{-7} \text{ C}$ by conduction process. What is the approximate mass decrease of the conductor?
Ans: $2 \times 10^{-18} \text{ kg}$
3. An electrically neutral object is given a positive charge. Does the mass of object increase, decrease or remain same?
Ans: decrease
4. Four charges each with charge $+q$ are placed at the four corners of a square of side ℓ . A charge $\frac{-q}{4}$ is at centre of square. Find the force on charge at centre.
Ans: zero
5. Two equal charges are placed at a distance 'd' apart. A third charge placed at 'x' distance from line joining the charges on a perpendicular bisector. Third charge experiences maximum force when x is
Ans: $\frac{d}{2\sqrt{2}}$
6. Three charges are placed as shown in the figure find the force on $-q_3$ in vector form at
Ans: $k \left(\frac{q_1 q_2}{b^2} + \frac{q_1 q_3}{a^2} \sin \theta \right) \hat{i} - \frac{k q_1 q_3}{a^2} \cos \theta \hat{j}$

7. A point charge Q is situated at a distance d from one end of a non-conducting rod of length L, carrying charge q. Find the force on Q.
Ans: $\frac{kqQ}{d(d+L)}$

8. Draw a graph showing variation of coulomb force F versus $\left(\frac{1}{r^2}\right)$, where r is distance between charges of each pair of charges, $(1\mu\text{C}, 2\mu\text{C})$, $(2\mu\text{C}, -3\mu\text{C})$. Which quantity represents slope of graph?
Ans: slope of graph \propto product of charges
9. Two equal point charges of $8\mu\text{C}$ are fixed at points $(2\text{m}, 0)$, $(-2\text{m}, 0)$. Another charge q with a mass of 91mg is released at point $(0, 0.1\text{m})$, at $t=0$. It is observed that q oscillates in SHM about origin. At $t=0$, the force on q is $9 \times 10^{-3} \text{ N}$. find q
Ans: $5\mu\text{C}$
10. For previous question. Find the frequency of oscillation
Ans : 5